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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/698,723

10/31/2003

Michael X. Ouyang

CRNG.043

1571

7590

07/28/2005

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EXAMINER

HINES, ANNE M

ART UNIT

PAPER NUMBER

2879

DATE MAILED: 07/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/698,723

Applicant(s)

OUYANG, MICHAEL X.

Examiner

Anne M. Hines

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10/31/2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☒ Claim(s) 1,6,8,14 and 20 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 October 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 10/31/2003.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Specification

The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: In claim 1 "at least one barrier layer disposed between the substrate and the OLED structure" is claimed, whereas the specification describes said barrier layer as being disposed on the opposite side of said OLED structure from said substrate, as also seen in Figure 1. Additionally, in claim 14 "at least one barrier layer disposed between the substrate and a light emitting structure" is claimed, whereas the specification describes said barrier layer as being disposed on the opposite side of said light emitting structure from said substrate, as also seen in Figure 1.

Claim 1 is objected to because of the following informalities: the claimed invention (OLED structure) cannot then comprise a part of the invention. This problem appears again in claims 6 and 8. Appropriate correction is required.

Claim 14 objected to because of the following informalities: the word "structure" appears twice in the phrase "at least one barrier layer disposed between the substrate and a light emitting structure structure". Appropriate correction is required.

Claim 20 is objected to because of the following informalities: the claim lacks the proper antecedent basis because of the phrase "the other substrate" due to its dependency on claim 15. It appears that claim 20 should depend on claim 16 instead of 15. The Examiner has treated the claim on its merits assuming this correction. Appropriate correction is required.

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "barrier structure disposed between the substrate and the OLED structure" must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 3-6, 9, 12-15, 17-19, and 22 are rejected under 35 U.S.C. 102(e) as being anticipated by Duggal et al. (US Pat. No. 6,891,330).

Regarding claim 1, Duggal discloses at least one substantially flexible substrate (Fig. 9, 40; Column 3, line 43), at least one barrier layer (Fig. 9, 50; Column 3, line 46) disposed between the substrate and the OLED structure (Fig. 9, 20; Column 3, lines 41-42), and at least one antireflection (AR) layer (Fig. 9, 90; Column 8, lines 24-25) disposed between the OLED structure and a display surface (Fig. 9, bottom edge).

Regarding claim 3, Duggal discloses the invention of claim 1 wherein the at least one AR layer includes a barrier structure (Column 8, lines 45-50). Wherein TiO_2 and ZrO_2 are inherently dielectric barrier structures because neither material conducts direct current and both provide a barrier against contaminants such as water vapor and oxygen.

Regarding claim 4, Duggal discloses the invention of claim 1 wherein the at least one barrier layer includes at least one stack comprised of a dielectric layer (Fig. 9, 50;

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Column 7, lines 11-16 and Column 7, lines 62-63) and a light absorbing layer (Fig. 9, 50; Column 8, lines 4-14).

Regarding claim 5, Duggal discloses the invention of claim 4 wherein the at least one barrier layer includes up to ten of the stacks (Column 7, lines 23-25).

Regarding claim 6, Duggal discloses the invention of claim 1 wherein respective dielectric layers are disposed between the at least one AR layer and the OLED structure (Fig. 9, 50; Column 7, lines 62-63), and between the at least one barrier layer and the OLED structure (Fig. 9, 50; Column 7, lines 23-24 and Column 7, lines 62-63). Wherein polymers are inherently dielectric because they do not conduct direct current.

Regarding claim 9, Duggal discloses the invention of claim 4 wherein the light absorbing layer is a metal (Column 8, lines 4-5).

Regarding claim 12, Duggal discloses the invention of claim 5 wherein the dielectric layers each have a mechanical stress, and the light absorbing layers have a mechanical stress, and the mechanical stress of the dielectric layers and the light absorbing layer substantially cancel (Column 2, lines 9-10). Wherein the mechanical stresses in all layers of a flexible multi-layer structure inherently cancel in order for the structure to be stable.

Regarding claim 13, Duggal discloses the invention of claim 1 wherein the barrier structure and the at least one barrier layer water vapor each prevent permeation water vapor therethrough at a rate less than approximately 10^{-6} g/m²/day and oxygen therethrough at a rate less than approximately 10^{-5} cm³/m²/day (Column 7, lines 16-25).

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Regarding claim 14, Duggal discloses a light emitting display device, comprising: at least one substantially flexible substrate (Fig. 9, 40; Column 3, line 43); at least one barrier layer (Fig. 9, 50; Column 3, line 46) disposed between the substrate and a light emitting structure (Fig. 9, 20; Column 3, lines 41-42) and at least one antireflection (AR) layer (Fig. 9, 90; Column 8, lines 24-25) disposed between the light emitting structure and a display surface (Fig. 9, bottom edge).

Regarding claim 15, Duggal discloses the invention of claim 14 wherein the AR layer includes a barrier structure (Column 8, lines 45-50). Wherein TiO_2 and ZrO_2 are inherently dielectric barrier structures because neither material conducts direct current and both provide a barrier against contaminants such as water vapor and oxygen.

Regarding claim 17, Duggal discloses the invention of claim 14 wherein the at least one barrier layer includes at least one stack comprised of a dielectric layer (Fig. 9, 50; Column 7, lines 11-16 and Column 7, lines 62-63) and a light absorbing layer (Fig. 9, 50; Column 8, lines 4-14).

Regarding claim 18, Duggal discloses the invention of claim 17 wherein the at least one barrier layer includes up to ten of the stacks (Column 7, lines 23-25).

Regarding claim 19, Duggal discloses the invention of claim 17 wherein respective dielectric layers are disposed between the at least one AR layer and the light emitting structure (Fig. 9, 50; Column 7, lines 62-63), and between the at least one barrier layer and the light emitting structure (Fig. 9, 50; Column 7, lines 23-24 and Column 7, lines 62-63).

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Regarding claim 22, Duggal discloses the invention of claim 17 wherein the light absorbing layer is a metal (Column 8, lines 4-5).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2, 7, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Duggal et al. (US Pat. No. 6,891,330) as applied to claim 1 above, and further in view of McCormick et al. (US Pat. No. 6,867,539).

Regarding claim 2, Duggal teaches the invention of claim 1 but fails to teach another substantially flexible substrate disposed over the at least one barrier layer. McCormick teaches a flexible substrate disposed over at least one barrier layer (Fig. 6, 58; Column 7, lines 63-64 and Column 8, lines 44-45) to protect the OLED from exposure to oxygen and moisture and allows the OLED display structure to be flexible (Column 1, line 67 to Column 2, line 10). Therefore it would have been obvious to one of ordinary skill in the art to modify the OLED display structure of Duggal by disposing a flexible substrate over at least one barrier layer, as disclosed by McCormick, in order to protect the OLED from oxygen and moisture while allowing the finished OLED display structure to remain flexible.

Regarding claim 7, Duggal fails to teach a hydrophobic layer between the other substrate and at least one barrier layer. McCormick teaches a hydrophobic layer between the other substrate and at least one barrier layer (Column 7, lines 63-67) in order to desiccate the interior of the packaged OLED device (Column 5, lines 64-65). Therefore it would have been obvious to one of ordinary skill in the art to modify the OLED device of Duggal by adding a hydrophobic layer between the other substrate and at least one barrier layer in order to desiccate the interior of the packaged OLED device.

Regarding claim 8, Duggal fails to teach a hydrophobic layer between the substrate and the OLED structure. McCormick teaches a hydrophobic layer between the substrate and the OLED structure (Column 5, lines 8-10 and Column 5, lines 61-65) in order to desiccate the interior of the packaged OLED device (Column 5, lines 64-65). Therefore, it would have been obvious to one of ordinary skill in the art to modify the OLED device of Duggal by adding a hydrophobic layer between the substrate and the OLED structure in order to desiccate the interior of the packaged OLED device.

Claims 16, 20, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Duggal et al. (US Pat. No. 6,891,330) as applied to claim 14 above, and further in view of McCormick et al. (US Pat. No. 6,867,539).

Regarding claim 16, Duggal teaches the invention of claim 14 but fails to teach another substantially flexible substrate disposed over the at least one barrier layer. McCormick teaches a flexible substrate disposed over at least one barrier layer (Fig. 6, 58; Column 7, lines 63-64 and Column 8, lines 44-45) to protect the OLED from

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exposure to oxygen and moisture and allows the OLED display structure to be flexible (Column 1, line 67 to Column 2, line 10). Therefore it would have been obvious to one of ordinary skill in the art to modify the OLED display structure of Duggal by disposing a flexible substrate over at least one barrier layer, as disclosed by McCormick, in order to protect the OLED from oxygen and moisture while allowing the finished OLED display structure to remain flexible.

Regarding claim 20, Duggal fails to teach a hydrophobic layer between the other substrate and at least one barrier layer. McCormick teaches a hydrophobic layer between the other substrate and at least one barrier layer (Column 7, lines 63-67) in order to desiccate the interior of the packaged OLED device (Column 5, lines 64-65). Therefore it would have been obvious to one of ordinary skill in the art to modify the OLED device of Duggal by adding a hydrophobic layer between the other substrate and at least one barrier layer in order to desiccate the interior of the packaged OLED device.

Regarding claim 21, Duggal fails to teach a hydrophobic layer between the substrate and the OLED structure. McCormick teaches a hydrophobic layer between the substrate and the OLED structure (Column 5, lines 8-10 and Column 5, lines 61-65) in order to desiccate the interior of the packaged OLED device (Column 5, lines 64-65). Therefore, it would have been obvious to one of ordinary skill in the art to modify the OLED device of Duggal by adding a hydrophobic layer between the substrate and the OLED structure in order to desiccate the interior of the packaged OLED device.

Claims 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over (US Pat. No. 6,891,330) as applied to claim 1 above, and further in view of Dickson (US Pat. No. 4,066,925).

Regarding claim 10, Duggal teaches the invention of claim 14 wherein at least one barrier layer includes a light absorbing layer (Fig. 9, 50; Column 8, lines 4-5). Duggal fails to teach the barrier layer including a dielectric layer having a thickness equal to one quarter wavelength of a visible wavelength and a light reflecting layer. Dickson teaches a barrier layer including a dielectric layer having a thickness equal to one quarter wavelength of a visible wavelength (Column 4, lines 23-27) and a light reflecting layer (Column 3, line 65 to Column 4, line 1; Column 2, lines 22-24) in order to increase the transmissivity of the barrier layer (Column 2, lines 22-24). Therefore, it would have been obvious to one of ordinary skill in the art to modify the OLED device of Duggal to add a dielectric layer having a thickness equal to one quarter wavelength of a visible wavelength and a light reflecting layer, as disclosed by Dickson, to the barrier layer in order to increase the transmissivity of the barrier layer.

Regarding claim 11, Duggal teaches the light absorbing layer as a metal but fails to teach the light reflecting layer as a mirror. Dickson teaches a light reflecting layer, see claim 10 rejection, but does not teach the light reflecting layer as a mirror. However, the American Heritage ® Dictionary of the English Language, Fourth Edition defines a mirror as a surface capable of reflecting sufficient undiffused light. It is obvious to one of ordinary skill in the art that a light reflecting layer, since it reflects, is a mirror.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anne M. Hines whose telephone number is (571) 272-2285. The examiner can normally be reached Monday through Friday from 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on (571) 272-2457. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Anne M Hines
Patent Examiner
Art Unit 2879

AmH
7/22/05

MSLg 7/22/05
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PRIMARY EXAMINER